

Serial No. 10/630,267
67028-014**REMARKS**

Applicant thanks examiner for the detailed remarks and analysis. Claims 1-18 and 26-29 have been cancelled. Claims 19-22, 24, 25 and 30-34 remain in the application. Claims 19 and 33 have been amended, and claims 35-37 added.

Claims 19-22, and 24-25 were rejected as being obvious over Machida et al. (U.S. 5,340,528) as modified in view of Kamagai et al. (EP 662383). Amended claim 19 requires the step of determining a volume of material received within a passage according to a relationship between material shrinkage properties and mold injection pressures and displacing the molten material with a plurality of bevel springs to compensate for changes in volume caused by solidification of the molten material. Machida et al. discloses ejector pins that exert a pressure during molding to provide uniform injection molding. Kamagai et al. discloses springs for biasing the ejector pins. However, neither Machida et al. nor Kamagai et al. discloses or suggests the step of determining a volume of material received within a passage according to a relationship between material shrinkage and injection pressures.

Further, the proposed combination is not proper as there would be no benefit, and the combination would render the Machida et al. device inoperable for its intended purpose. In the Machida et al. device the ejector pins are advanced by a piston to force material out into the mold cavity during solidification of the plastic material. Once the plastic material has solidified, the ejector pins move forward to project into the mold cavity and eject the part. (Machida et al. col 5, lines 28-50). Adding the springs (12C) as disclosed in Kamagai et al. would provide no benefit as the ejector pins in Machida et al. already are controlled to accept material.

Further, the ejector pins in Machida et al. move to eject the part once solidified. The addition of springs to the ejector pins of Machida et al. would destroy the ejection function, and thereby and intended function of Machida et al. As appreciated, the inclusion of springs to an ejector pin would cause an uneven ejection force on the part, possibly causing damage, and most certainly complicating control of ejections forces in the Machida et al. Accordingly, such complications surrounding inclusion of springs with an ejecting pin would teach away from such a modification. For these reasons, the combination of Machida et al with Kamagai et al. is not properly supported by the requisite motivation and suggestion. Further, the proposed combination does not disclose or suggest all the limitations of amended claim 19.

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Claims 30-32 were rejected as being obvious over Machida et al. as modified in view of Suzuki et al. (U.S. 4,497,359). Claim 30 requires the step of determining an amount of molten material received within a passage according to a relationship between material shrinkage and mold injection pressures. Machida et al. does not disclose such a step. The office action refers to a portion of Suzuki to teach this step (Col 5, lines 14-36). However, such a step is not disclosed. Suzuki discloses several variables utilized to determine a volume of molten metal material (V1), however, none include a material shrinkage value. Other variables disclosed in Suzuki include cross-sectional area and length of a passage; however, material shrinkage properties are not disclosed or suggested. Accordingly, the proposed combination does not disclose or suggest the limitations of claim 30.

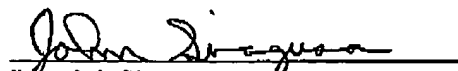
Claims 33 and 34 were indicated as being allowable if rewritten in independent form. Applicant has so amended claim 33. Further, Applicant has added claims 35-37. Claim 35 is in independent form and requires the step of determining a volume of material required to compensate for material shrinkage in a localized region according to a relationship between material shrinkage properties of the plastic material and injection pressures. Claim 36 depends from claim 35 and further includes the step of biasing the movable member toward a position where a face of the movable member is flush with a surface of the cavity prior to introduction of molten plastic. Claim 37 depends from claim 35 and requires the step of determining a biasing force for the biasing the movable member against injection pressure to provide displacement of the movable member to receive a volume of plastic material greater than or equal to two times the volume determined to compensate for material shrinkage. These limitations are not disclosed by the cited prior art.

All objections and rejections have been addressed and the claims are in condition for allowance. A notice to such effect is respectfully requested. The Commissioner is authorized to charge Deposit Account No. 50-1482, in the name of Carlson, Gaskey & Olds, P.C., \$100.00 for an additional independent claim in excess of three. If any additional fees are due, however, the Commissioner is authorized to charge Deposit Account No. 50-1482, in the name of Carlson, Gaskey & Olds, P.C., for any additional fees or credit the account for any overpayment.

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Respectfully Submitted,

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Dated: August 31, 2005